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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,744	08/14/2003	SUNG-MAO WU	9720-US-PA	1743
31561	7590	04/22/2005	EXAMINER	
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE			PATEL, ISHWARBHAI B	
7 FLOOR-1, NO. 100			ART UNIT	
ROOSEVELT ROAD, SECTION 2			PAPER NUMBER	
TAIPEI, 100			2841	
TAIWAN			DATE MAILED: 04/22/2005	

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/604,744

Applicant(s)

WU, SUNG-MAO

Examiner

Ishwar (I. B.) Patel

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2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 6-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of specie one, claims 1-6, in the reply filed on March 23, 2005 is acknowledged. The traversal is on the ground(s) that the four species recite the common features and should be considered as the same invention, the common features include the side circuit formed on the sidewall of the laminated layer. This is not found persuasive because different embodiments of the invention constitute different species and have different structural limitations. A complete search for all the species will be burdensome to the examiner. As claim 6, with limitation "the at least one side circuit includes a bending circuit on the side wall" does not read on the elected specie of figure 2, but rather reads on figure 5, which is not elected specie, claim 6 has been further withdrawn from consideration.

The requirement is still deemed proper and is therefore made FINAL.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been received and has been placed of record in the file.

Drawings

3. The drawings are objected to because the figures are improperly cross hatched, figure 2, in particular. All of the parts shown in section, and only those parts, must be

cross-hatched. The cross-hatching patterns should be selected from those shown on page 600-114/115 of the MPEP based on the material of the part. The elements in side / plan view may be shown with different shading. See also 37 CFR 1.84(h)(3) and MPEP § 608.02.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The abstract of the disclosure is objected to because of the presence of legal phraseology "comprises", (line 1). Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujiki, US Patent No. 5,369,379.

Regarding claim 1, Fujiki, in figure 2, discloses a printed circuit board, at least comprising: a plurality of patterned circuit layers (pattern circuit layers formed on substrate 2, 3, 4, 5 and 6); an insulation layer (2, 3, 4, 5 and 6) between the patterned circuit layers for isolating the patterned circuit layers from each other, wherein the insulation layer and the patterned circuit layers together form a laminated layer (laminated board, see figure 1); and at least one side circuit (side circuits c, see figure 1) on a sidewall of the laminated layer for electrically interconnecting at least any two (circuit layers formed on substrate 2, 4 and 6) of the patterned circuit layers.

Regarding claim 3, Fujiki further discloses the at least one side circuit includes a uniform width (width of side circuits c, see figure 1).

7. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamaguchi et al., (US Patent No. 6,734,370).

Regarding claim 1, Yamaguchi et al., in figure 1B, discloses a printed circuit board, at least comprising: a plurality of patterned circuit layers (electrically conductive traces on substrate 22); an insulation layer (substrate 22) between the patterned circuit layers for isolating the patterned circuit layers from each other, wherein the insulation layer and the patterned circuit layers together form a laminated layer (laminated board, see figure 1B); and at least one side circuit (electrically conductive line 32 along side 30) on a sidewall of the laminated layer for electrically interconnecting at least any two of the patterned circuit layers (column 5, line 38-42).

Regarding claim 3, Yamaguchi et al., further discloses the at least one side circuit includes a uniform width (uniform width of element 32, see figure 1B).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al., as applied to claim 1 above, and further in view of Handforth et al., (US Patent No. 6,876,085).

Regarding claim 2, Yamaguchi et al., discloses all the features of the claimed invention including side wall circuit as applied to claim 1 above, but is silent about the shape structure of at least one side circuit, such that impedances of the sidewall circuits and the patterned circuit layers are matched with each other.

Handforth et al., on column 1, line 25-35, recites that mismatching of the impedance and problems associated with that in connecting conductive traces are known and has to be solved to reduce the cross talk to adjacent signals and to have efficient performance of the device. Handforth et al., further recites to form signal traces in various width to optimize impedance matching, (page 3, line 38-39). Also, Handforth et al., (in figure 5, on page 4, line 23-37), recites the traces with tapered shape (varying width) and states that a skilled artisan will understand that many possible dimensions will provide advantageous.

Further, this is a structural claim. Yamaguchi et al., discloses all the features of the structure as claimed. Therefore, a person of ordinary skill in the art would consider the patterned circuit layers, including the side traces layers, of Yamaguchi must have matched impedance for the efficient performance of the device.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe shape structure the at least one side circuit of Yamaguchi et al., has a shape structure so that impedances of the sidewall circuits and the patterned circuit layers are matched with each other, as taught by Handforth et al., in order to reduce cross talk and to have efficient performance of the device.

Regarding claim 4, Yamaguchi et al., discloses all the features of the claimed invention as applied to claim 1 above, but does not disclose the at least one side circuit includes a varying width.

Handforth et al., as applied to claim 2 above, recites signal traces in various width to optimize impedance matching, (page 3, line 38-39), and traces with tapered shape (figure 5, on page 4, line 23-37).

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to vary width of the sidewall circuits to match the impedance of the patterned circuits to optimize impedance matching to have reduced cross talk and efficient performance of the device.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the circuit board of Yamaguchi et al., with the at least one side circuit having a varying width, as taught by Handforth et al., in order to match the impedance of the patterned circuits to optimize impedance matching to have reduce cross talk an efficient performance of the device.

Regarding claim 5, Yamaguchi et al., discloses all the features of the claimed invention as applied to claim 1 above the at least one side circuit includes a trapezoidal shape.

Handforth et al., as applied to claim 2 above, recites signal traces in various width to optimize impedance matching, (page 3, line 38-39), and traces with tapered shape (figure 5, on page 4, line 23-37).

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide sidewall circuits with a trapezoidal shape (tapered shape) to match the impedance of the patterned circuits to optimize impedance matching to have reduced cross talk and efficient performance of the device.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the circuit board of Yamaguchi et al., with the at least one side circuit having a trapezoidal shape, as taught by Handforth et al., in order to match the impedance of the patterned circuits to optimize impedance matching to have reduce cross talk an efficient performance of the device.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Takahashi et al., US Patent No. 6,351,194, in figure 1, discloses a multilayer circuit board with circuit patterns on bottom surface of upper board 11a (shown in detail figure 3) connected to circuit patterns on top of the lower board 11b (shown in detail in

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figure 4) connected by side surface pattern C1 and C2. Takahashi et al., further recites the impedance is matched by the circuit wiring (M, shown in detail in figure 4).

Asada et al., US Patent No. 6,307,259, in figure 1, recites a multilayer circuit package which adequately acquire impedance matching for signal wiring, column 2, line 23-26, and discloses patterned circuit layers (173, 174 and 174) connected by side wall trace (37).

Pillai et al., US Patent No. 6,583,498, in figure 2, discloses signal line (150) with varying width to maintain desired impedance.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272 1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ishwar (I. B.) Patel

Examiner

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April 17, 2005